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SPECIAL ARTICLES

FOOD AND PHYSIC

JOHN W. S. McCULLOUGH, M.D., D.P.H.

HEALTH EDUCATION

DR. A. S. LAMB

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Food and Physic*

By JOHN W. S. McCULLOUGH, M.D., D.P.H.

Food

The topic of food is of interest to everyone. This subject engrosses the attention of the public at the present time to a greater extent than at any former period. This is largely due to the discoveries made of hitherto unknown properties of food, to better general knowledge of food values and to the popular and correct belief that the kind of food used influences bodily health.

Milk

Of all the foods we consume none is more important than milk and none is so universally used. Milk is the natural food of the infant and enters largely in the form of milk itself, butter, cheese, ice cream and other products, into the ordinary diet of everyone.

Nations and peoples using milk as an article of diet are stronger both mentally and physically, have developed to a higher degree in education, in the arts and sciences, in progressive and enduring forms of government, and in almost every way, than nations and peoples who have not been accustomed to use this food.

What is Milk?

Milk is the "grass of the land." Go with me in the early morning to the pasture field and there you will see the placid cow (the common source of milk with us) cropping the succulent grass. This she swallows and when satisfied she lies down on her side in a shady place and proceeds to chew her cud. In other words the grass is put through a further mastication preparatory to its digestion in her huge four-compartment stomach. This food eventually enters the blood, passes to the udder, whence it is extracted by the sucking calf or by the buxom milkmaid.

*Read before the Kiwanis Club, Barrie, Ont., October 28, 1927.

Why is Milk such a Good Food?

Milk is a food of the first rank because of its ready digestion, its cheapness and because of its contained fat and protein, sugar and vitamins.

Vitamines

In 1911 Casimir Funk coined the name Vitamine to describe a substance which he believed to be curative of an Oriental disease known as beri-beri, which is common in Japan, the Philippines and in other lands where the diet consists mainly of polished rice. The best known vitamins are those designated "A," "B," "C" and "D" but there are a number of others and it is impossible to say what further discoveries of this nature may be made.

Sources of Vitamine "A"

The most abundant sources of Vitamine "A" are milk, butter, fat, the yolk of egg and the green leaves of cabbage, lettuce, spinach and carrots. The germ of wheat and other cereals contain a considerable proportion, and that is why white flour is a poorer food than whole wheat flour.

Qualities of Vitamine "A"

Vitamine "A" is soluble in fat, so it is called the fat soluble vitamin, and it possesses a remarkable power in the growth of children. Its absence is a predisposing cause of an eye disease called by the name of Xerophthalmia or dry eye.

Vitamine "B"

Vitamine "B" is also found in milk and its products as well as in yeast and the seeds of plants, and in eggs. It is the *water soluble vitamin* so called because it is soluble in water. This vitamin is the one which prevents beri-beri, a wasting disease characterized by paralysis of the limbs, or excessive swelling or oedema (water in the tissues) and heart failure. Vitamine "B" like Vitamine "A" is essential to growth, and animals and children deprived of these vitamins will be small in stature and readily subject to a variety of diseases.

Vitamine "C"

Vitamine "C" gives vigor and general health and prevents scurvy, a serious disease chiefly of children and of adults who are deprived of fresh foods. This vitamin is found abundantly in tomatoes, pineapples, oranges, lemons, grapefruit, in leafy vegetables such as spinach, lettuce, cabbage and in potatoes, turnips and onions.

Vitamine "D"

Vitamine "D" enables the body to benefit from the minerals contained in foods. Without it, these minerals do very little good and the body is likely to develop rickets, seen in bow-legged children. Cod-liver oil and egg-yolk are very rich in Vitamine "D" and, like sunlight, are preventives of rickets.

The Dangers of Milk

Milk is the only animal food used in the raw state. Meat, fish and other animal foods are all cooked and are thereby made comparatively safe.

Two hundred and fifty years ago an inquisitive Dutchman named Anthony Van Leuwenhoek (fahn-lay-van-hake) found that by looking at objects through different shaped pieces of glass, the objects were enlarged just as print is enlarged through a reading-glass. His further experiments in this direction led to the discovery of the microscope by means of which objects heretofore invisible to the eye can be enlarged many thousands of times. This was followed by the discovery of germs, or bacteria, some of which cause disease. The most of germs are harmless; a number are of the highest value; indeed were it not for germs or bacteria life upon the earth would soon be impossible. The familiar processes of bread-making, of beer, wine, and vinegar production; the making of cheese and the silent destruction of dead animals, trees and other wastes are accomplished by the action of germs. The germs of disease make milk the most dangerous article of food we use. Milk may carry disease such as tuberculosis, typhoid fever, diphtheria, scarlet fever, septic sore throat and the manure which often reaches milk is a common cause of the infant diarrhoea, so destructive of young lives. In the present year there were upwards of 5,000 cases of typhoid fever, and 500 deaths from milk-borne typhoid in Montreal. Chatham, Regina, Winnipeg and most of great cities have had outbreaks of milk-borne diseases from time to time. Tuberculosis of the bovine or animal type and of the human type is frequently traced to milk and everyone is familiar with the death-dealing properties of infant diarrhoea, the source of which is usually dirty milk.

How may Milk be made Safe

In Ontario the protection of milk is the duty of the municipality, and it is a disgrace that in these days when knowledge of the measures to ensure safe milk is available, that a food product of such high value and of so varied a character should cause illness and disease.

A proper by-law should be passed by the municipality and strictly enforced. This by-law may be formed upon the model published by the

Health Department or upon that of places where this product is properly safeguarded. There should be adequate inspection of the dairy farms and of every stage of production, transportation and distribution. The cows should be clean and healthy, the food and stables clean, the latter well lighted and ventilated; there should be a separate milkhouse; the milkers and attendants should be healthy and free from disease; there should be proper facilities for the cooling of milk; the utensils used should be sterilized; the temperature of the milk kept at a low degree. In the distributing dairy the milk should be bottled and pasteurized with the most scrupulous care and kept cool until used. Much education is necessary in the case of producers, distributors and even users of milk, for it is not fair to expect bottles of milk left on the doorstep in the hot sun to remain sweet.

The reason why milk is readily susceptible to the influence of germs is because it is a fine medium for their growth and as it becomes warm the germs grow and multiply the more readily. Milk should be protected all along its course from the cow to the user to prevent disease reaching it and to make assurance doubly sure, pasteurization or the holding of the holding of the milk at a temperature of 140 degrees to 145 degrees F., for half an hour and its subsequent cooling to 40 degrees F will make it safe for use.

All these precautions are worth while not only as an economical problem but especially in the protection of our children against disease which may cripple them or cut short their lives.

Physic

In 1656 Samuel Culpepper published the 6th edition of his Dispensatory, or description of medicines used in England. In this book details are given among others of the curious remedies in use, such as the scrapings of elk's horns, the juice of vipers, the brains and liver of frogs, snails, burnt egg shells and many others.

In 1739 Joanna Stephens sold her secret remedy for dissolving stone in the bladder, to the British Government after a formal enquiry into its merits, for £5,000. This prescription is as follows:

"My medicines are a powder, a decoction and pills. The powder consists of eggshells and snails both calcined. The decoction is made by boiling some herbs (together with a ball which consists of soap, swine's cresses, burnt to blackness and honey) in water. The pills consist of snails, calcined, wild carrot seeds, burdock seeds, ashen keyes, hips and hawes, all burnt to blackness, soap and honey. The powder is given in drachm doses in cider or other liquor followed by the decoction in half pint doses. If the latter disagrees, it may be replaced by the pills." This

is a remarkable prescription—but there is no evidence that it had any effect comparable with the price. It was even more expensive than that referred to in the story of a young man who, halting between the calling of a doctor and that of a naval architect, chose the latter. He was not a brilliant student and when he came up for his first examination, the question was put to him "What is a dry-dock?" He answered, "A doctor who won't give you a prescription for whiskey."

The British people are remarkable users of drugs. This is illustrated by the fact that the ha-penny stamp on each bottle of patent medicine sold in England brings a revenue of £1,800,000. Canada in proportion to population runs the old land a close race in this respect and with as little advantage.

But the medicine of the 17th century differs only in degree from some of the most modern. We use the extract of the adrenal glands, that remarkable product which is the source of courage, and energy, which causes the hair of the cat and perhaps our own to stand up in the face of danger, which helps the force of our drives on the golf course, checks the flow of blood and injected into the heart muscle sometimes revives those almost at the point of death.

We use the extract of the thyroid gland to cure the physical and mental symptoms of the cretin, that undersized and mentally defective person whose thyroid gland is deficient in secretion.

We use pituitary extract from a tiny gland at the base of the brain in the art of midwifery and in other ways. Insulin, the product of the pancreas, discovered by an illustrious son of this county, in preserving the health and comfort of the diabetic; chopped liver or liver extract in the cure of pernicious anaemia, and even testicular extract for the regeneration of the failing powers of old men.

Besides these, there is a considerable list of serums of the blood such as diphtheria and tetanus antitoxins, meningitis serum, anti-venene for snakebite, etc., used for the cure of disease, as well as vaccines against smallpox, typhoid, diphtheria and scarlet fever, cholera and the plague, so that, with perhaps greater success, we are following in the footsteps of our fathers in the sources of medical treatment.

In 1872 *H.M.S. Challenger* was sent on a voyage of investigation to the Southern Seas. The results of this investigation were of such magnitude that it took 20 years to classify them. Among other things studied were the strata of the sea.

The Plankton and Nekton

There are two great strata of the sea. The surface stratum contains that vast aggregation of pelagic life called the plankton. The plankton

comprises the animal and vegetable life of the sea which has no means within itself of locomotion and which, in consequence, moves passively with the currents.

The Nekton comprises the large sea-animals; codfish, porpoises, whales, etc., whose food is the plankton. All fish are cannibals. They devour their weaker kind and one another. The life of the sea is an illustration of an endless chain of destruction and of survival of the strong. "They shall take who have the power and they shall keep who can." The tiny plants and animals of the sea form the food of the larger fish. The plankton is the "grass of the sea" and abounds in vitamins of perhaps all forms.

Among the important fish living on the plankton is the cod. The cod is the source of "cod-liver oil," not so pleasant as the milk of the cow but highly important in relation to disease. Cod-liver oil is largely used as a preventive and curative treatment for tuberculosis and an affection of the bones in children, seen in bow-legs, and known as rickets. Cod-liver oil is an almost specific remedy for rickets. The preventive factor is believed to be the fat soluble vitamin "A". Crude cod-liver oil is about 250 times as rich in vitamin "A" as butter fat, and this with the use of the sun's rays or ultra-violet light in the winter, when the sun's rays are feeble, bids fair to solve the treatments of rickets. The value of cod-liver oil amply justifies its designation as the "grass of the sea".

Another product of the plankton is the whale. Empire or blue whales are the largest of sea fish sometimes reaching a length of 100 feet and affording 28 tons of blubber or whale fat. The whales feed on the plankton straining it through their forked teeth. An interesting thing is that whale oil is said to enter into the manufacture of Norwegian butter, and it is not an undesirable addition as it abounds in various forms of vitamins. All sea food is highly valuable not only as food but because of the vitamins it contains.

Sickness and Disability

In this country we have too much of the luxury of illness. Canada spends 270 million dollars a year on sickness and 2 per cent. of the population is continually ill and unable to work. We have 40,000 hospital beds which have cost us 180 millions and the annual upkeep is 50 millions. Sickness is the greatest cause of poverty and disabling sickness seriously interferes with industry and production. No effort is too great to lessen this toll of illness with its tremendous consequences of loss of life and disablement.

In this direction nothing plays so high a part as education, particularly of the young. The older population is difficult to educate in new things, the young are easily taught.

Education paves the way for better health organization. No other branch of public work is so badly organized and administered as that of health in Canada. This county has no less than 30 boards of health. With a population of over 80,000 people, an assessed value of over 22 millions and an annual income from taxes of nearly two millions, there is spent only about \$6,000 annually or 7½c per head of the population, on public health in the County of Simcoe.

Of this sum, much is wasted or misapplied. The thirty health officers are all part-time men, who give a moiety of their time to public health work. Some of them do much more work than their slender pay warrants, but in the main the system is such that adequate results need not be expected. For satisfactory public health work you must, as in any other business, have some one on the job all the time if the business is to prosper. It is high time in Ontario and all over Canada, that many of the weak units for public health, the villages, the townships and the smaller towns should be combined under a full-time, properly trained, medical officer of health and efficient organization. This would ensure a unit for health and an area of population financially able satisfactorily to carry on such an important work. This is the plan in operation in the United States, in England, in New Zealand and in every country where there is the wisest and best experience in promoting the health of the people.

Its Cost

Such a plan involves the expenditure of money, but its results would fully justify the expense in the improved health and comfort of our people, in longer life, a lower death-rate, greater production, and a large saving in the cost of institutions for the care of the insane, the sick and the incurable population. At least one half of the loss of day's work would be prevented: the mortality of 15,000 babies dying in the first year could be reduced by one-half and this alone would add 7,500 a year to our population of individuals at least the equal of any type of immigrant, for surely the sons and daughters of the pioneers who have made this country and this province what they are, are the best citizens to take the places of their sturdy fathers and mothers. So I make a plea for better health organization in Ontario. It will come just as quickly as the public demand it. We have made progress in the last twenty years. Tuberculosis, diphtheria, scarlet fever, and many other affections have had their ravages greatly reduced.

When I went to the Health Department 18 years ago the Government spent \$49,000 a year on public health. The expenditure is now \$750,000. Diphtheria antitoxin in my days of practice in this county cost \$2.50 per 1000 units. Since 1916 this and many other beneficent remedies for the

prevention and cure of disease are given free to the public and the cost, for example of \$2.50 per 1000 units of diphtheria antitoxin is now 12 cents. Tuberculosis clinics, clinics for mothers and babies, medical inspection of schools, sanitary engineering and other divisions have been organized and public health diagnostic laboratories have been spread all over the province. It may be of interest in this connection to point out that Ontario had the first public health diagnostic laboratory in America, established in 1890 over John Kent's jewellery store on Yonge Street, Toronto, and antedating the first in the United States (that of New York) by three years.

But a stupendous work in public health in Ontario awaits our action, and no better stimulus could be given to such a movement than the influence of the business men who constitute the membership of Clubs such as this all over the country.

The committee on periodic health examinations of the Medical Society of the County of New York has recently sent a letter to each of the members of the organization requesting aid in popularizing periodic health examinations:

By further spreading the idea among the patients, by thorough and painstaking examination of those applying for this service, and on the part of specialists by a whole-hearted co-operation for and specialized services required in connection with these examinations.

A pamphlet on the subject prepared by the New York Tuberculosis and Health Association is offered by members for distribution to patients through physicians, waiting rooms or by mail from the offices of the Association.

Source: *Health News*, June 20, 1927.

Health Education

By DR. A. S. LAMB,

Director, Physical Education, McGill University, Montreal

The constant progress of scientific knowledge and method necessitates within our curricula continued adjustments of the content of the courses to meet new demands and new situations. This persistent pressure is obviously a sign of progress but our institutions of learning must ever be on the watch to adopt only those amendments which are going to lead toward greater efficiency.

This is an age of prevention, the minimizing of social ills and maladjustments and the prevention of sickness and disease, involving both personal and public problems and obligations. The morbidity and mortality rates of our country, the losses of health and life because of preventable and avoidable disease, the ignorance of health matters on the part of our college graduates and other supposedly educated people, are compelling and forceful reasons why more serious consideration should be given to such matters in our curricula. Although our life expectancy has increased sixteen years in less than half a century, there is no valid reason why it should at the present time be six years less than it is in New Zealand and Australia. A baby born in Canada to-day, might, with proper care, be reasonably expected to live to the age of fifty-six years, while the same baby born in New Zealand or Australia would have a life expectancy of sixty-two years.

In spite of the remarkable progress that has been made in the prevention of disease and the promotion of health, there are still 2 per cent. of our population constantly sick. The economic loss of this alone is \$270,000,000 per year; the loss in infant mortality, which in some parts of Canada is as high as 142 per 1000 living births, is estimated at \$180,000,000 and the annual maintenance of our Hospitals, Asylums and Sanitaria \$50,000,000, a total of \$500,000,000. 50 per cent. of this loss could be prevented by the mere observance of our present day knowledge of health measures.

While we can evaluate and put a monetary value on sickness when it interferes with the productivity of the nation; when it entails losses to the individual in earning power; when it costs money to get well; when it costs money to maintain institutions, which are necessary for the care of the sick and unfit, still we cannot evaluate perhaps the most important aspects of health.

What is health? *Health should mean more than freedom from disease. It should be a compelling positive force, radiating enthusiasm in which the individual is at his maximum efficiency, in harmony with both mental and physical environment.* Human capital is the nation's greatest asset and exceeds all other forms of national wealth as resources, property, machinery, raw or manufactured products. This capital, to be of value, must be healthy and the great regret is that for the most part we appreciate the value of life and health only after they are lost. *Health cannot be considered as an entity, like recognized forms of clinical conditions, as typhoid fever or pneumonia, but must be considered as a state resulting from two forces, inheritance and the way of living. It results from life processes and reflects exact and known laws—the laws of hygiene. It is not merely physical but also mental and social. The notion that a man could be divided into a physical component, a mental element and a spiritual spark is, of course, combated by all the pertinent facts of psychology and physiology. Man is a unity and with reference to his health we must recognize such unity. Browning asked: "Thy body at its best, how far can that project thy soul on life's lone way?" What Browning knew by poetic insight, we know to-day by the discoveries of science. Mind and body are one, and to conceive of physical education or physical training in terms of physical health—perspiration, muscle tone and intestinal peristalsis—is to ignore vital points bearing on the nature of man. *Health is function, not quantity nor mass that can be measured by ounces or inches, nor is it an end in itself.*

*The problem in health education is to help boys and girls to acquire certain essential knowledge regarding all aspects of health, to practise certain habits that will prevent infection and maintain the maximum functioning of the body, not to be interested in health as a state of itself, but to be greatly concerned with what one, with health, can do in the world. Dr. J. F. Williams defines health as "an effective functioning of the entire organism towards social ends." Education in health, then, is concerned with the same aim that confronts general education or civic education or moral education. It works with special tools towards special skills, knowledge and attitudes precisely as other fields do, but its general purpose is the aim of education in general.

Health education, through health supervision, health service and health instruction, must deal with ways and means to not only prevent the causes of death, but also the defects which do not cause death.

The appalling figures made known after the great War in which it was shown that from 30% to 50% of our young men, the cream of our country, were found unfit for service, should have been the cause of a tremendous impetus in health education and training, but what has been

*Williams, J. F., A.P.E.R. May, 1927.

done? In our educational institutions we carry on with comparative indifference to the fact that the same percentage would, to-day, be unfit if called upon for service.

The young men and women who go out from our schools and Colleges year by year, carry with them habits, attitudes and powers of judgment that have been moulded and developed by their experiences as undergraduates. They are, or become a part of, the best informed portion of society, and progress in a large measure depends thereon; the recognition and approval of the standards and practices of the future are in their hands. It is the duty of our schools to see, that in addition to the relation the graduates bear to their special or professional spheres of life, that they bear the right relationship, or have the right ideas and ideals of health in its broadest aspect, and thus become more powerful factors in the formation of public opinion and in public practice. The question has been asked as to whether or not the care of the students' health is any concern of the school or university. The question of the care of illness may be more debatable, although the separation of curative and preventive medical practice is becoming less and less distinct. The investment the community has in the student should, in itself, apart from all other reasons, be sufficient to warrant some consideration and care toward keeping the student in school by the dissemination of information and advice which would aid him to that end.

Students who go to the university do so with an extremely elementary and fragmentary knowledge of health matters. The only instruction they receive in their preliminary education in some Provinces, is in the 5th, 6th and 7th Grades of the Public Schools. Much of this instruction is not in any way related to the real problems of life and cannot, in perhaps the majority of cases, be given under conditions which involve the *essential considerations of attention and interest on the part of the student*. The trend of affairs would indicate the desirability of a modification of our curricula, in order to assure ourselves that students do not leave the university until they at least have some knowledge of the fundamental laws of health, its practice and its relation to the welfare of the community.

In the United States, the President's Committee of Fifty on College Hygiene, composed of College Presidents and others, has, during the past five years, made an extensive study of the question, and has collected data on the hygiene programmes of approximately 450 educational institutions in the United States. The work of this Committee has been aided by the United States Government and the American Social Hygiene Association has sponsored the work during the past three years. The investigations included one hundred and forty-two colleges and universities, thirty-three teacher colleges, twenty-eight normal schools, sixty-seven medical

schools, forty dental schools, twenty-one training schools for nurses, ten private schools of physical education and one hundred and one schools of theology.

The data indicated that college hygiene programmes, or the college student health programme, have been developed chiefly along four main lines. These are listed below as separate programmes, although they commonly overlap:

1. "*Informational Hygiene*," (Personal, Social and Mental Hygiene.) of the 142 colleges and universities, 80 had required courses.
2. "*Administrative Hygiene*," (Public Hygiene, Hygiene of Environment). Supervision and regulations of the living, working and social conditions that surround the individual. Of the 142 colleges and universities, 111 had organized courses.
3. "*Student Health Service*" (Medical Service to students). Of the 142 colleges and universities, 103 had some method of assisting the student, including a required medical examination.
4. "*Applied Hygiene*," Physical activities of the students, athletics, recreational activities, gymnastics. Development of organic systems and neuro-muscular controls. Of the 142 colleges and universities, 132 had organized programmes of required work.

Numbers three and four receive some attention in most universities, but unfortunately for the student and the country, very poorly equipped and trained individuals are charged with the tremendous responsibility of endeavouring to cover the whole field of Health Education. Then again, a Health Service that tells a student he has Diabetes and does not see that he is cared for, might well be classified as merely an information bureau.

Personal and Public Hygiene receive very scant attention in most institutions and the following is typical of the type of course that is dignified with the title "Hygiene". An examination paper read recently for a course in so-called "Hygiene" required an amazing knowledge of bones, joints and muscles, a meaningless aggregation of words with no consideration whatever as to how the machine functioned within itself, or its relation to its environment. *Hygiene, as it should be considered, is the application of knowledge to man's needs and desire for the preservation of health.*

Suggested subject matter would be as follows:—

1. "*Informational Hygiene*," (Personal, Social and Mental Hygiene.) The meaning of health, physiologic basis and factors that influence health. Natural defenses. Nose, throat, skin, teeth, eyes, ears, etc. Fatigue, sleep, worry, anxiety. Special lectures on Social Hygiene. Venereal Disease. Foods. Constipation. Posture. Benefits and Choice of exercise. Emergency treatment of unconsciousness and wounds.

Artificial respiration. Why an annual Physical Examination. The importance of health to the individual and the community.

2. "*Administrative Hygiene*," (Public Hygiene, Hygiene of Environment.) Preventive medicine and health. Industrial medicine. Occupational hazards. Community problems in mental hygiene. Community problems in social hygiene. Tuberculosis and the community. Diseases of middle life. Common sources of infection, man, animals, etc. Weather, Air, Ventilation, Water, Waste, Sanitation. Foods, production and handling. Narcotics, nostrums and Quackery. The community's interest in maternity and infancy. Safeguarding the health of the child. The place of voluntary health organizations in public health work. Civic and Provincial responsibility. Hospitals, Health Centres and Agencies. The cost versus the result of public health work. The responsibility and relationship of the individual.

In some institutions the above courses are given in conjunction with the required programme in the Department of Physical Education, either as part of the regular class period, or at special lectures given through the Department. In other cases, such courses are given by separate Departments of Health or Hygiene, either through the Department of Physical Education or through the Faculty of Medicine.

Too frequently we are led to the opinion that gymnasium classes, intra-mural or intercollegiate athletics, satisfy the need for health education. A properly conducted department of physical education may incorporate adequate health instruction and training, but in most cases, this is not so. The purpose of Physical education is the development of the individual in:—

(1) The development and strengthening of the organic systems through properly selected physical activities adapted to the age, sex, and development of the individual.

(2) The development of the neuro-muscular system in general, but with particular reference to the acquisition of neuro-muscular skills for safety, leisure time and aesthetic values, giving to the individual pleasure and satisfaction.

(3) The development of attitudes toward play through mental relaxation and by a change in the mental attitude through participation in free and simple activities requiring no conscious anxiety and by being brimful of spontaneous and joyful expression, thus forming a definite contribution to joyous living and to the morale of the community.

(4) The development of standards of conduct wherein with the right kind of leadership and ideals, the teacher has unlimited possibilities in influencing the student to put into operation standards of sportsmanship, fair play and many other attributes of character.

If, then, our conception of health is not merely freedom from disease, if in addition to organic vigor it infers mental and social fitness, if health is "an effective functioning of the entire organism towards social ends," then might we not consider the contribution that the "Sports" of our boys and girls can make to this end. It is not necessary to argue for the inclusion of sports in the programmes of our schools, nor does it seem necessary to argue for its inclusion as a recognized part of educational procedure. Already the sports programme as a part of the activities in Physical Education has been very largely adopted as a part of the general educational curriculum. There have always been and perhaps there will always be, difficulties arising in connection with the athletic or sports programme in our schools, colleges and universities. The relation which activities bear to the general curriculum, to other departments and to the general life of the school, its teaching staff and students will ever be a problem for careful consideration and at all times will demand wise and mature judgment in its direction.

Difficulties may present themselves with the administrator or director who may on the one hand fail to appreciate the relationship of his programme to the general field of education and thus fail to co-relate his activities or perhaps he may feel that there cannot be a sufficient number and variety of activities in the sports programme and that the Principal and members of the staff are interfering with his departmental activities by too pressing a demand on the boy's time for academic attainments.

Further it may be that the boy who is expert in motor skills may be exploited to the point of neglect in his academic work and thus suffer the penalty of popularity and athletic ability. For the boy it is extremely difficult, there are very pressing demands, he is urgently needed and refusal on his part may be interpreted as a lack of school or club spirit and even disloyalty in a very pressing cause. It may be that these demands come from his very closest friends and even his parents may add their influence in the decision that he must render. These demands are for the present and are chiefly to bolster up a team or it may be to win a point for a club and so urgent might they become that one might imagine if not acceded to, Confederation would be in jeopardy. The future, however, is not considered and wise guidance is necessary for the protection of the boy and the part he must play in the game of Life.

Then again it may be that the difficulty lies with the school authorities themselves, for it is not difficult to believe that while sports have little or no place in some schools it seems to be the chief business of others and one sometimes wonders how the students make the necessary progress with their studies in the face of so many distracting activities and influences.

It has been intimated that one of the difficulties experienced by some

schools is that many boys are being called upon to take part in an excessive amount of competitive activity with the consequent onset of general fatigue and thus interference with their academic obligations.

It is difficult to understand how this can be so if there is proper supervision of the amount of activity indulged in, not only within but without the School. However, it is very easy to understand if there is no check made on the extra-mural activities of the boy. There are cases where an accomplished athlete carries on with all school activities and after school hours plays for an athletic club with the possible addition of a Scout Troup, a Settlement or a Church League. Here are presented many difficulties, the chief of which is the possible harm to the boy physically. In addition, it is quite conceivable that the school hours would be those during which both his mind and body demand a well earned rest. It is obviously unfair to the boy, and as school authorities we must either prohibit his participation in the school activities or in the extra-mural activities and naturally his school affiliations should take precedence.

Many criticisms have been made of college athletic activities and one of the charges has been that participation in athletics has seriously affected scholastic attainments. The same criticism has been levelled at the High Schools, the feeling being held that so much time was devoted to athletics that the student could not pay proper attention to his academic progress. Mr. Hay Finlay in 1926, made an extensive study of this problem as it concerned the students in McGill University and his findings were quite illuminating and most interesting. The study was one in which the academic standing of athletes and non-athletes was compared throughout the whole college course. Previous findings at Harvard, University of Illinois, University of Minnesota and others by Paul Rhoton, T. F. West, U.S. Naval Academy and Prof. Martin Remp were studied and compared with the results of his investigations.

Two phases of the subject were studied:—

- A. "The comparative study of the length of time the various groups remained in College as indicated by withdrawals year by year."
- B. "The comparative scholastic records of the groups as indicated by the academic grades secured in the courses taken."

The investigation covered the following classes in their whole University course—

Faculty of Arts 1921-22-23

Dept. of Com. 1921-22-23

Fac. of App. Sci. 1921-22-23

It included a study of 859 men and the entering class in each faculty for the years '21, '22, '23 was taken and followed through to graduation.

The findings in brief are as follows:

"A larger percentage of Athletes complete their courses than Non-athletes, the difference being:

Athletes	61.25%
Non-athletes	41.10%

"This would indicate that Athletics have no deleterious effect on scholarship."

"Fewer Athletes failed or withdrew during their first year or second year than Non-athletes."

1ST YEAR COURSE

13.75% Athletes withdrew or failed.

34.10% Non-athletes withdrew or failed.

2ND YEAR COURSE

12.50% Athletes withdrew or failed.

14.80% Non-athletes withdrew or failed.

"Athletes averaged slightly higher academically than Non-athletes."

"There was a greater percentage of "A" men scholastically in the athletic group than there were in the Non-athletic group and a greater percentage of Non-athletes in Class "B."

	Athletes	Non-athletes
Class A.	7.14%	6.71%
Class B.	46.43%	59.93%
Class C.	46.43%	38.33%

It should be noted that the boy who is prominent in the athletic world is usually known to more of the students and the teaching staff than the boy whose abilities do not run in this direction. When such a boy fails in his studies everybody knows about it and too frequently his participation in athletics is unjustifiably held to be the cause. It of course may be the cause but in many such cases the unwise and unprofitable use of his leisure time and perhaps his general inaptitude may offer a more satisfactory explanation for his failure. Dr. Clark W. Hetherington is authority for the statement that "according to popular standards twenty-minutes of exercise a day is sufficient for adult health. Adults apply this standard to children. Experience has shown, however, that children of the elementary school age (if they are to gain the development necessary for efficient citizenship) need between four and five hours of exercise or big-muscle activities each day, and children of the high school age need from two to three hours. The difference between two to five hours for children and the twenty minutes for adults indicates the difference in importance between the educational function in developing power through the years of childhood and youth, on the one hand, and the hygienic function in maintaining efficiency after maturity on the other hand."

Dr. Thomas D. Wood, and R. F. Cassidy in "The New Physical

Education" says: "When Physical Education presents a programme which is psychologically and physiologically sound and therefore pedagogically acceptable, it will find itself in organic relationship with education as a whole and with the other subjects or departments represented." Physical Education will, however, particularly in its "Sports" programme, always be face to face with real problems. The plastic material being dealt with, the intimacy of contact with the minds and hearts of the children, the real interest in fundamentally enjoyable activity and the limitless opportunities for influencing them for good or for ill, demand on the part of the profession of Physical Education as complete as possible an understanding of underlying principles and the machinery for most effectively influencing the future.

Of sports and the like, the British Board of Education has the following to say:

"The Team System as an instrument of education utilizes the gregarious instinct which begins to awaken in children round about the age of ten, and, as adolescence supervenes, develops for good or ill into one of the chief springs of conduct and character. The development of this instinct, no less than that of the competitive instinct which has equally deep roots in human nature, is of importance far too great to be left to chance. To regulate these instincts in the interest of wider ends, and to turn them into channels fruitful both to the individual, and the community, must be one of those fundamental aims of education on which it is hardly necessary to enlarge."

In that splendid publication of the Carnegie Foundation for the advancement of Teaching, "Games and Sports in British Schools and Universities" (Bulletin No. 18) Dr. Howard J. Savage in speaking of the British Schools says: "It seems to be recognized that if games and sports have value in one type or stratum of education, they have value also in another, not only for their effect upon the physical fitness of Englishmen, but also for the spirit of co-operation and the ethical standards that they inculcate and foster. Whatever the motives behind the conscious promotion of games in English educational institutions of all kinds and especially those of an essentially popular tone, there is no lack of appreciation on every hand of the fact that being phenomena natural to the years of adolescence and young manhood and womanhood, they must be used in education."

He declares that the public schools are "The nurseries of Sport" and continues: "It is merely stating a fact to say that the Public School tradition in sports is the embodiment of the highest ideal of British sportsmanship The greater the Public School atmosphere in our sports the better for the game, the better for those who play them, and certainly the better for the community, because the best type of sportsman makes the best citizen."

"The attitude of mind that it engenders in the boy is one of the strongest holds that the English public school tradition exercises over the national life, and, moreover, it lies at the very core of the Anglo-Saxon conception of Sport."

It is stated that studies, sports and especially the association with other boys and with masters are recognized as the three formative influences of the public schools, and it would be both difficult and useless to try and decide which is the most important. Games and sports, although not formally recognized as such, appear in the English schools as an instrument of education and not an educational excrescence.

"The tradition of sportsmanship that the English public schools have built up during the last century and a quarter, not only dominates the games of the schools themselves, and their graduates in whatever walk of life, but also shapes the course of amateur sport in every part of the world. It is as much a heritage of American sport as the English language and the English Common Law are other heritages of our national life."

Comparatively speaking, we are unfortunate in Canada in that this influence is not exerted in this way but rather in the opposite direction. The general emphasis upon professionalization and commercialization of sport has had its influence on the Universities in Canada and similarly the influence has, it is feared, been felt in both Preparatory and High Schools throughout the country. Our hope, however, for the maintenance of the amateur ideal and for sportsmanship lies first in the Public School and so on up to the University. If these fail, what hope remains?

Those who are responsible for the direction and supervision of athletic affairs aided by the sympathetic support of other teachers are directly responsible for seeing that the youth of the land have presented to them the opportunity for selecting those things from their experiences which will lead toward and form the foundation of sportsmanship and character. Prejudices have still to be overcome. Scholasticism in its pure sense with neglect of instincts and emotions, asceticism with contempt for the physical and exaltation of the mind and Puritanism with its belittling of play and worship of seriousness. The mention of physical activity and sports, to many merely means a purely negative attitude with no possible relationship to the constructive and positive aims in general education. The view is still widely held that physical education consists of drills for health and discipline and that possibly some defects might be corrected and children kept fit for their academic work. With the recent emphasis on the positive value of athletics, playgrounds, recreation, physical efficiency and preventive medicine, public opinion has undergone a change and there is a growing recognition of the important place that properly directed activities can and do take in the building of useful citizenship.

There is no doubt that in "Sports" we see exercised at almost every turn certain character traits, which expressions may be good or bad according to the direction or leadership. The real individual is exposed to expression and to see a boy play in a game is usually a fair indication of the kind of boy he really is. Growing tendencies are being firmly established and the ideal or objective determines just the end to which they will be put. Co-operation and loyalty are of no constructive value if used for unwise and unfair ends. It is therefore an essential consideration that our sports be supervised by those who will set the examples and endeavour to inculcate into the boy and his activity positive ideals in the development of the attributes of character. There is no other phase of the boy's life where the opportunities are so great and where the investment pays such handsome returns in the development of character and citizenship.

By co-operation with all other departments the protective and preventive function *in the development of organic vigor and the maintenance of health is exercised and favourable and significant personal and social adjustments are made possible*. Character and moral training have no more fertile field than in the big-muscle activities where the instinct tendencies and emotions of the human nature are exercised so freely. It is a fountain of opportunity for acquiring and practising desirable characteristics but one can only be assured of their being desirable with proper guidance and leadership.

Are we as school authorities providing such leadership and are we as teachers fully conscious and aware of our programme as a part of the education of the whole child for usefulness and efficiency in after life. Do other teachers understand what we feel our contribution can be and are we fully appreciative of our opportunity in directing the programme of sports in our own schools so that they will bear the right relationship in the mental, organic, motor and moral education of the boy for his life of tomorrow.

If then, our programme of "Sports" is wisely directed as a part of Physical Education and if the suggested courses are effectively given and properly related to the programme in physical and health education and health service, the individual should receive a general understanding of the causes and effects that produce, maintain and improve health; they should accustom him to periodic health examination; they should give him an attitude of discriminating and experienced judgment in matters that relate to the health of his family, his dependents, his community and himself, and if he thus gains constructive and defensive health habits as a common part of his everyday life, he will then be better fitted to live and to serve his community.

Provision for Medical Care of Indigents

By DR. W. E. GEORGE

In opening this paper I cannot do better than quote a sentence from Simon's "History of English Sanitary Institutions":—

"Among influences which largely affect national statistics of disease and death, few are of greater power than *poverty*, and to make the poverty of a people less extensive or less intense is among the best sanitary services which can be rendered."

It is therefore of immense sanitary interest that emergencies of distress threatening the poorer parts of the population should be relieved by palliative philanthropy. As long as men have gathered together, the relatively prosperous have assumed a kindly care of those among them who are needy. As social development has progressed, society has learned to express itself collectively through municipal and Governmental agencies. Charity was taught in the Ethics of the Ancient Egyptians, in the Sacred Scriptures of the Jews, in the Buddhist religion, and finally had its best expression in Christian countries. Indeed, the Great Public Health Movement which began in the 18th century was an effort inspired by a desire to remedy the ignorance, the physical suffering, the social degradation of the poor.

The Poor Law was passed in England in 1601 and provided necessary relief of impotent, lame, old and blind, and such other among them being poor and unable to work. The laws for the protection of the poor were well organized in England long before the Health organization was effectually established, and finally when the Local Government Board (after which our Provincial Board was patterned) was established it was the Poor Law Board which took charge of the health of the nation.

Having established, therefore, that the medical care of the indigent is not only a public responsibility, but an important sanitary measure, it behoves us to examine our methods to see whether the agencies of our people are so designed as to serve the needy and afflicted.

Municipalities have many problems in their relief work. The Northern town is not only required to provide for their own indigent population, but also for a large proportion of indigents from the surrounding unorganized areas who come to them sick or without sustenance; or others come in search of work and must be supported, or poor women come from the same areas to be confined; or T.B. workmen come from

abroad and break down there under heavy work; or care must be provided for the wives and families of men confined to jail; or for large families moving to town from the country or rural areas without having first secured employment. These problems, many of which are impositions, drain their resources and make Northern municipalities very antagonistic, occasionally causing them to refuse to care for communicable diseases, returning the patients to their homes by train with serious danger to the public health. Communicable diseases were included in this imposition, but Dr. Godfrey soon after coming to the Government provided special relief for these cases by Special Order.

Hospital Care

Since hospital care is closely associated with medical treatment, it was thought advisable to refer first to this service as applied to the indigent, but it cannot be too strongly emphasized that neither statute nor regulation requires the institution to provide medical care and the hospital care does not include medical treatment of indigents. In the Amendments to the Hospitals and Charitable Institutions Act, 1926, provision is made for hospital care of indigents at the expense of cities, towns or *counties*. You will note that the financial responsibility which formerly rested on the councils of the smaller municipalities, namely villages and townships, for the care of their indigent is now to be assumed by the County. This responsibility amounts to \$1.50 per day per patient with the Government granting further aid to the extent of 50c per day for 120 days per case. After this time the Government grant is the same as the relief rate, or 10c per day.

Since the County must assume responsibility for indigents from villages and townships, it has been assumed by villages and townships in the Districts where there is no County organization that they have no responsibility for the hospital care of their indigents. But Mr. W. F. Nickle, the ex-Attorney General who drafted this section, gave a ruling before he left the Department that where County organization does not exist the organized townships and villages are liable, as per the reading of the Act previous to 1926.

As much of my District is without municipal organization, all such legislation and problems must receive consideration in their application to unorganized areas as well as organized.

Now under the Hospitals Act we find that an employer is responsible, *where he has a medical contract*, for maintenance of an employee in a public hospital. This section does not meet the needs of the settler in unorganized areas but the industrial worker only, and accordingly an effort was made to ascertain what provision was made for him. It is most

gratifying to be able to state that an Order-in-Council was passed comparatively recently, at the time of the Fire in Northern Ontario in 1922, which provides for hospital care of indigents from unorganized territory at the expense of the Government.

It is evident from the presentation of the case that hospital care of indigents is reasonably complete, both for the older organized section of the Province, and for the newer unorganized areas. Possibly something should be said here regarding the work of the Children's Aid Society when an effort is being made by authorities to take charge of children whose parents or guardians cannot or will not bring them up otherwise than in destitution or presumably in crime.

The splendid efforts of service clubs deserve mention, especially their work for crippled children. The economic value of rehabilitating these handicapped children is deserving of highest commendation.

Medical Care

The legal responsibility for the Medical care of indigents is set out in the Public Health Act, (1927) Section 52. There you will find that the Medical Officer of Health or other physician appointed by the Council of a municipality for the purpose, shall provide the Medical care after the Relief Officer or head of the Municipality has indicated that in his opinion a patient is so classed. Of course, it is set out in other sections that the local Board shall be responsible for the enforcement of the Act; while it is the duty of the District Officer and Provincial Department of Health to see that the Local Board functions efficiently in this and other Public Health matters covered by that legislation. I would remind the local Boards of Health represented here that the sanitary value of relief is as much due to sustenance as medical relief.

The comprehensiveness of this section of the Public Health Act is admitted by all. It provides most efficiently for the medical relief of all cases of sick poor in that part of Ontario which has complete municipal organization, such as exists in most of the Counties, but in the Northern Districts where large areas are without Municipal Organization, this section does not operate and the destitute are entirely unprovided with medical supervision.

One or two small exceptions must, however, be made.

In the case of communicable diseases, where placarding is necessary, the Government meets its responsibility by providing medical attention, food and supplies to those placed under quarantine.

Again, in unorganized territory, employers of labor must make a contract with a physician for the payment of which he may deduct 50c to \$1.00 per man per month from the wages of the men. Or should he

neglect to make a contract, the employer becomes personally liable for necessary medical attention.

The legislation just quoted (Section 52 of the Public Health Act) indicates that our people recognize this public responsibility and the sanitary importance of this form of relief. Can it be, then, that those pioneers who come at the invitation of our Government to settle our frontiers, and who usually pass through a period of years of privation, and have no provision for their needs are less deserving than those poor in the organized municipalities? Surely not. Indeed, if there is any class more deserving than another it is the settler of our frontiers brought there by the various government officials from the Agent General of Ontario in London to the twenty-five or more Crown Land Agents in Northern Ontario.

I am not advocating State Medicine or National Insurance, although it is self-evident that the unemployed and the aged obtaining regular allowances from a fund to which they themselves have contributed, is a better system than the demoralizing, indiscriminate, charitable grants from municipal or private funds.

If these are deserving poor, why, then, are mothers in the homes of these destitute settlers without medical attention when they are having their children, increasing markedly the list of infant deaths, already over-large from general debility directly traceable to their poverty? There is evidence that many babies lose their lives because of this lack of care. Or why must children in these same homes, suffering from many acute illnesses, take their chances without medical aid? Or the settler himself? Is Ontario without means or the will to succor her pioneers when they suffer from Accidents, Appendicitis, Pneumonia, Haemorrhage, Acute obstruction, Typhoid, etc.

It would appear that *the most charitable explanation* is to be found in the fact that it is only in the last fifteen years, with the opening of Temiskaming and the areas about the Twin Cities, that the problem has developed to an extent as to excite public attention, although it has existed in a limited way since the organization. In many parts of Parry Sound and Muskoka the settlers have picked up and left as they found the land was not fit for agriculture. The same thing is now taking place in Haliburton. I am glad to note that the Government is taking a hand to prevent the continuance of pauperism. It is only fair to say that a much more critical and severe explanation might be made. Possibly the representatives of the people of this Province, being largely located in old Ontario, find so much to be done at the public expense at home that they have neither time or money for the pioneers on the frontier.

Since the absence of provision for medical relief to the indigent in the unorganized areas has now been brought to your attention, you may well ask who serves them in their distress? And the answer is: the local doctor; without remuneration he is giving his services most generously, comparing favorably with the best traditions of the medical profession; or some volunteer organization occasionally lends a helping hand. Suffice it for me to relate the history at one point only. There, a physician applied himself diligently to the service of the people, with the result that after four or five years he and his wife were forced to leave the place *broke*, with \$10,000 of non-collectable debts on his books. He has now a very large and remunerative practice in a Northern town. This physician was followed by another, who found collectable accounts not more than would meet his expenses. After five years he was compelled to leave, practically broke, but with \$10,000 on his books. He in turn has been succeeded by a third physician, who is very likely to repeat the experience. However, as the area is agricultural and has been opened some few years now, it may be possible that the present physician will be able to make a reasonable living, due to the slow but steady improvement in the prosperity of the section.

Nearly every physician in Northern Ontario loses hundreds of dollars annually in caring for the needy in unorganized areas. A physician in my District, who is well known to many of you, informed me that he would have a fortune if he could collect his accounts of indigents in his neighborhood living in areas without municipal organization.

Conclusions:—

First,—Hospital care of the poorer classes of the people in both organized and unorganized territory is reasonably well-provided for, with the possible exception of indigent institutional treatment of those coming from organized villages and townships in the Districts without county organization.

Second,—Hospital care does not include medical treatment.

Third,—There is reasonable legal provision for medical care of genuine poverty in organized municipalities.

Fourth,—A large proportion of the indigent of unorganized territory are pioneer settlers.

Fifth,—Members of the class in question in territory without municipal organization are provided with no statutory medical relief. They are forced to depend on the charitable services of the local physicians or the occasional help of a voluntary organization, such as the Red Cross.

Solutions and Recommendations:

Sickness is as terrible an aggravation of poverty as poverty is an aggravation of the sickness, and efficient administration of sanitary laws is

among the best helps which can be given to the poorer classes of the population, and those who fail in such administration are among the worst oppressors of the poor. The Public Health Act acknowledges the sanitary value of medical care of indigents. We would therefore make our first recommendation that both fields of *poor relief* and medical relief be united under the administration of the Local Board of Health as the Local Health Authorities are the best judges of the extent and value of the sanitary and social dangers to be relieved. This recommendation has the endorsement of British precedent.

It is painful to recognize the quantities of indiscriminate, benevolent intentions, together with vast sums of money, which run to waste under the misused name of charity; especially is this true at Christmas. Charitable resources are thrown out in a sort of scramble, while many organized charities have financial difficulties. This condition does not help the poor to help themselves, but is in danger of producing social disorganization.

Although it is a fundamental of political science that they who do not live independently of alms out of their neighbours' taxes ought not to be sharers in political privileges; and although there is no more difficult problem in the modern politics of poverty than how to deal with those elements of the community who are tending to settle into that relatively hopeless sediment of low level idleness and mischief, and although many such believe the country owes them a living, and again, although it is a primal law that the individual is required to shift for his own survival, not dependent on the community for an unfair share of protection, from the rewards of personal efforts, yet in our system extreme poverty is entitled to relief and the destitute have a right to sustenance and comfort in the localities in which they belong, hesitating to impose on even idlers and wasters the extreme penalty of death from starvation and exposure. Even the physically strong can conditionally claim protection against the casual danger and distress. Help, to be of value, must tend to help the poor to help themselves. To this group, undoubtedly, belong the indigent from unorganized territory. Is Ontario, then, the wealthiest Province of this prosperous country, without benevolent thought for the afflictions and physical sufferings of that large proportion of settlers and pioneers, whose thread of earning power is insufficient to meet the emergency? Yet on this delicate suspension thousands bear up steadfastly against the demoralizing influences and strong attractions to immorality and crime. All honor to them as they gradually win their way to comfort and independence. I think you will agree with me that Ontario is not deficient in any of the finer moral attributes, and when her people have grasped the conditions as a result of repeated notice, their conscience will begin to prick and the Government will be aware that it is time to add another

plank to their platform. Public Health requires funds to get results. It is essentially a spending department, but not wasting. The pawns are human lives, pitted against money; poverty against health; relief against despair.

We cannot close this paper, then, without an urgent appeal: first, to the wisest heads and the kindest hearts in this Province for their support; and second, to the Government for legislation to provide medical care for this large body of deserving citizens for whose suffering with temporary and urgent distress on the frontiers of our rapidly settling Northern townships no provision has yet been made in the Provincial Statutes of Ontario.

The importance of short-wave or violet light in the prevention and cure of certain diseases seems to be a well-established fact. The study of sunlight therefore is playing an increasingly important part in scientific investigation.

The Weather Bureau of the U.S. Department of Agriculture in experiments conducted at its various stations has determined that it is skylight rather than direct sunlight which is comparatively rich in violet rays. If this is true, it is not so important for us to bask directly in the sunlight as in daylight.

The Birmingham, England, Board of Education is replacing the usual glass windows of its schoolrooms with a glass through which the ultra-violet rays can pass after experiments showing that children in rooms equipped with the new glass averaged a three-pound greater gain in weight and one-half inch greater gain in height than those in rooms equipped with ordinary window glass. Also, boys studying under the new glass showed eight per cent. more red blood corpuscles than their fellows in the next room.

Source: *The Forecast*, April 1927.

Recent Developments in the Field of Preventive Medicine and their Nursing Implications

By EDITH HURLEY

Professor of Public Health Nursing, University of Montreal.

It is with considerable diffidence and deference that I approach this subject as, first of all, I am attempting to replace on your programme, Professor J. G. Fitzgerald, Director, School of Hygiene and Connaught Laboratories, University of Toronto, who was asked to prepare and give a paper under this title, but was unable to do so due to his visit to Europe. Secondly, the "implications" of the title seem to call for more scientific exposition than a public health nurse is qualified to give. However, with your indulgence I shall present some data on this subject, showing how, in the French Health Centre of the Montreal Anti-Tuberculosis and General Health League and University of Montreal, which serves as laboratory for the School of Public Health Nursing of the University of Montreal we have interpreted recent developments in the field of preventive medicine and applied them to our nursing problems.

The French Health Centre is situated in the eastern and largely French speaking section of Montreal. The centre proper was equipped and is staffed by the General Health League. The University of Montreal conduct their school for Public Health Nurses in the same building. The direction and control of both centre and school are in the same hands. The centre is used as a health demonstration unit and to provide the field training for the school.

May I begin with the second part of the subject and, in discussing it, show our way of interpreting "nursing implications"? We interpret the term "nursing implications," in relation to recent developments in the field of preventive medicine, as—meaning that nurses, and particularly those nurses engaged in Public Health activities, must keep themselves informed of the march of scientific progress and be ever alert to welcome new discoveries as real students do. It also follows that it is not enough for the nurse engaged in Public Health work to be merely a student, *always learning*. She must become more and more of a teacher so that she can impart her knowledge to the families whom she serves in such a way as to convince mothers and fathers that the service she renders their children in teaching the lesson of the prevention of diphtheria, for example, thereby avoiding an attack of this disease, is as effective a service and

much more worth while than that rendered by bed-side care in nursing a child through a case of diphtheria.

As a rule, the classes served by the public health nurse have not yet recognized the doctrine that to prevent is better than to cure. ("An ounce of prevention is worth a pound of cure.") It has, consequently, been our experience that the public health nurse who gives service to the family in the form of actual bed-side nursing, makes more of an appeal and inspires more confidence than does the nurse who goes into the home to render an even greater service, that of teaching the family that when inoculations and vaccinations are given, such severe illnesses as diphtheria, small pox, typhoid and scarlet fevers are prevented. How often has a public health nurse gone into a home to teach how certain illnesses can be prevented by very simple methods, and has been met with indifference on the part of the family whom she has gone to help, and yet when that same nurse is called in by an anxious mother or father to give bed-side nursing care to a member of the family stricken with a preventable disease, she is welcomed with open arms.

It is not granted to every one of us to be a convincing teacher, but persistent effort and the refusal to be discouraged, combined with enthusiasm and faith in her mission will help the public nurse to teach the lesson of preventive medicine to those whom she serves. A teacher to carry conviction must know her subject so well that, after the routine instructions are given, she is prepared for questions and answers. This necessity for a fund of knowledge brings me now to the first part of our subject—that is—"recent developments in the field of preventive medicine." What are some of these recent developments concerning which nurses should be informed? It may serve the purposes of this paper to mention the three that are the most recent, to the knowledge of the writer, and with which she has had personal experience.

1st—The discovery and application of the toxoid or anatoxine Ramon for the prevention of diphtheria.

2nd—The protection against tuberculosis given the new born by Calmette's vaccine.

3rd—Vaccination against typhoid-fever by ingestion of typhoid bacilli with capsules according to the method of Dr. Besredka and introduced into this country by Dr. Boez.

Dr. Ramon, Dr. Calmette, Dr. Besredka and Dr. Boez are all workers in the Pasteur Institute, Paris, and men whose scientific standing is unquestioned.

Dr. Ramon, Director of the Antitoxin Laboratories of the Pasteur Institute, discovered in 1924 the diphtheria and tetanus anatoxines—a discovery which some authorities consider equal in value and importance

to that of the antitoxins for diphtheria and tetanus. The mission and the role of the Ramon anatoxines have been to transform at will, poisons as injurious as the diphtheria or tetanus toxins into inoffensive products endowed with immunizing properties and capable of being employed in the preventive therapy of certain illnesses of man or animals. Dr. Ramon came to discover his famous anatoxines by the observation of a fact, unimportant to the lay person, but enough to enthuse a man guided by science and by the wish to help humanity; which was that the toxicity of the diphtheria toxin was weakened by the addition of a solution of formalin in the proportion of 2 per 1000. Ramon deduced from this that the weakening of the microbic poison would increase in direct ratio with the quantity of formalin added, the temperature of the medium in which one placed the toxin being raised to 40 degrees centigrade. Thus he obtained, in thirty days, by the addition of a solution of formalin of 3 or 4 per 1000 non-toxic products, but with antigenic powers retained and so able to immunize the animals such as rabbits for laboratory purposes, an immunity which permitted him to inject up to 100 times the fatal dose without fatal consequences for the animal inoculated. He continued to observe the anatoxine and discovered in it very definite characteristics. This product preserves its immunizing properties for a year and, heated to 70 degrees centigrade, it continues to be efficacious. These two qualities give still greater practical value to the discovery of Professor Ramon from the point of view of the preservation of the vaccine and of its therapeutic efficacy.

When the French Health Centre was ready in January 1926 to undertake the immunization against diphtheria of pre-school age children, it was decided to use the anatoxine Ramon for the reasons already set forth, rather than the better known and more generally used on this continent, toxin antitoxin. The anatoxine Ramon was made available by the Connaught Laboratories of the University of Toronto which were producing it, and furnished to us by the co-operative Montreal Anti-Tuberculosis and General Health League. We have some rather interesting data in connection with our use of the anatoxine Ramon. To date, 515 children have been given the anatoxine, divided into two groups—those who had only two doses of the anatoxine and were then Schick tested, and those who were given three doses of the anatoxine. It was decided to proceed with the three doses because 43% of the group receiving only the two doses gave positive Schick reaction. In regard to the use of the anatoxine Ramon, the Pasteur Institute recommends the following:—"Two subcutaneous inoculations are often sufficient for immunization; the first being $\frac{1}{2}$ c.c.- of the anatoxine followed, after a delay of 15 days or three weeks, by a second injection of 1 c.c. To obtain certainly a percentage of

98 to 100% of immunity, it is recommended to make a third injection of anatoxine of $1\frac{1}{2}$ c.c. 15 to 20 days after the second inoculation." In March 1927, after the children inoculated in 1926 had shown only 57% immune, it was decided to give the three doses to assure the 98 to 100% immunity. As this group began the series of 3 inoculations only in March 1927, they have not yet been Schick tested so it is impossible to give data at this writing regarding their immunity.

The role of the public health nurse in this particular piece of work was to get the parents to bring their children back for the Schick test, for its subsequent reading, and, if the reading were positive, to get the child back again for the third inoculation. You can visualize, from the number of required visits to the Health Centre, the tremendous amount of effort put forth by the nurses. To facilitate matters we finally decided to present a certificate to every child found immune after his Schick test to testify to all the world that Jean Paul Charette, aged 3 years, has passed his Schick test and was now, we hoped, forever free from contracting diphtheria. The certificate bears the name of the General Health League, and the seal of the University of Montreal, and is signed by the doctor in charge of our pre-school clinic, most impressively "Director of the Immunization Service against diphtheria." We have since found some of these certificates in family bibles and even tacked up in the homes, usually in the parlor. The certificates are really quite pretty, not to mention their most impressive wording so there is genuine eagerness to have one in every home. It seems a rather sad commentary on human nature that the certificate means more to our families than the immunity against diphtheria. In resorting to this bribe to get results we are better able to appreciate the advice of the old Quaker who said to his son starting out into the world—"My son thee must get money—get it if thee canst honestly—but get money," and we are out to get results, even if a little bribe is necessary. Fortunately for us, the appeal to come for the Schick test did not bring anyone's wrath down on our heads as was the case in New Jersey when the School Board sent around word that every child must have a Schick test. One irate mother wrote back to tell the School Board that she didn't want her boys given any test to see if they'd make Sheiks—because she's read the book and seen the movie and didn't want any Sheiks in her family.

We were recently honored by a visit from Sir George Newman, Chief Medical Officer of the Ministry of Health, England, and in explaining our work we mentioned that we were giving Calmette's vaccine to protect our new-born babies against tuberculosis. Sir George stopped us at once and said: "Now that is interesting—that's what I want to know about." So perhaps you will be interested in hearing what we have done along that

line, as we understand we are the only organization on the North American Continent doing this work and we began it nearly a year ago—on June 23rd, 1926, to be precise. On that date the first dose of the Bacillus Calmette Guérin vaccine or "BCG" as it is commonly called, was given in North America, and young Alexandre Trepanier, aged 3 days, had the honor of being the recipient and a real pioneer along lines of preventive medicine. The steps leading up to the actual application of the "BCG" vaccine are rather interesting. At the October 1925 meeting of the Associate Committee on Tuberculosis of the National Research Council, Dr. Boudouin representing the Université de Montréal, stated that the University was prepared to bring a delegate from the Pasteur Institute, Paris, to direct the research on tuberculosis. In April 1926, Dr. A. Pettit, an associate of Dr. Calmette, arrived in Montréal, and it was decided to prepare the B.C.G. vaccine as the contribution of the University of Montréal to the National Research program. Under the scientific direction of Professor Pettit, the vaccine was prepared and made ready for distribution. For its actual administration the French Health Centre's demonstration area was used. In this area, through the students in the public health nursing course, the University is in constant contact with a population of 22,000 persons. The total number of births registered for this area in 1926 was 628 and, as we are in a position to make immediate contact with every new-born baby either through knowledge of its mother from our Prenatal Clinic or through the weekly registration of births at the office of the Parish priest, every facility was afforded us to administer the vaccine. The technique followed was given us by Professor A. Pettit after the recommendations of Professor Calmette himself—and is as follows: "The vaccine must be administered as soon as possible after its preparation (2-3 days). Three doses are necessary for the premunition and are given on alternate days in the same week as, for example, Monday, Wednesday and Friday. The first dose is given on the third day after birth when the mother's milk is usually established, the second dose on the fifth day after birth and the third dose on the seventh day. Each dose is mixed with milk, preferably that expressed from the mother's breast, but the milk in any case should be 37 degrees centigrade." The baby swallows the dose mixed with the mother's milk both making up a teaspoonful, and we have not had the least difficulty in persuading any baby to swallow the entire contents of the spoon, as the attenuated tuberculosis germs are mixed with glycerine which makes a sweet mixture very much to the baby's taste. The first dose should be given one half hour before the feeding and the two other doses should be given one hour before the morning meal. We have followed our new-born infants very carefully, as you may imagine, and we have not noted any reaction, beyond an oc-

casional green stool, after the first dose. Some rather amusing things have occurred in connection with the administration of the B.C.G. vaccine. One mother asked us if it was given to make her baby sleep better and another whose baby broke out with heat rash last summer which cleared up about the time the third dose was given attributed the improvement in the baby's skin to the vaccine. Although this vaccine is so new, we have not had any great difficulty in persuading our families to have it administered, perhaps due to the fact that in nearly every family in our demonstration area there has been some history of tuberculosis and as a result, anything that will prevent this well known and dreaded disease, is welcome. Since June 23rd, of last year we have premunized (to use Dr. Calmette's own word) 195 babies to date. These babies have been closely followed, but we are confronted with the problem of a floating population in our demonstrative area, as we are dealing with perhaps the poorest section of Montreal, and, in spite of all our efforts, when the moving seasons set in, in May and October, we lose some of our babies through the parents moving out in the night to conceal their destination and not leaving any trace to permit following them up. However, of the 195 babies immunized, to date, we find that 150 are in good health; 34 babies moved and were lost; 7 babies were reported sick (cases not connected with tuberculosis) and 4 babies are dead in this group, though none from tuberculosis. Of the total number of babies, 4 are in contact with an active case of tuberculosis in the home and they are all well at the present time. Our ambition is to keep all these babies under observation to ascertain the certainty, extent and duration of immunity. We desire also to extend this service as widely as possible, and to make it available to the practising physicians generally. Our nurses have 100% of the babies in half of our demonstration area under our observation, and we have for the entire demonstration area 80% of the prenatal cases which Sir George Newman told us is a world record; so you can see how it is possible for the nurses to administer the vaccine. Naturally, three visits are necessary in the course of the week to each new-born baby, but as we also carry on a visiting nurse service with bed-side care, it is possible to render this additional service to our babies.

The third division of my paper, that is concerning the use of the new capsules for the vaccination against typhoid, has had a very personal implication, I might say, so far as our nurses are concerned, as twelve out of our staff of sixteen took the capsules, when our typhoid epidemic broke out in Montreal, rather than the hypodermic injections. These capsules, as I have already stated, were introduced into this country by Dr. Boez who came to the University of Montreal during the winter to give a series of lectures on bacteriology. The capsules had been used with success in

Bulgaria last year when a typhoid epidemic threatened so Dr. Boez prepared them for use in Montreal. The dead typhoid germs are mixed with dried bile and made up into capsules, three of which are consumed by ingestion. These capsules are taken on three successive mornings before breakfast. Our nurses stated that beyond a slight malaise they suffered no bad results, two of them reported a rather severe diarrhoea.

We are not yet in a position to report on the efficacy of this method, but hope that a study will be made, in order that it may be compared with the inoculation method. If it is as successful an immunizing method, it is better, because people much more readily take capsules than submit to inoculations.

Rising Death-Rates

A STATEMENT FROM THE CANADIAN TUBERCULOSIS ASSOCIATION

AN editorial in THE MEDICAL OFFICER of London, England, reviewing the statement of Sir George Newman on The State of the Public Health, says Sir George states we must expect the death rate to rise in the near future and the editorial suggests that: "This need not disturb us; for the rise which must occur is an automatic reflection of the increased average age of the population, it will not denote an increase in mortality—which indeed never varies from 100 per cent.—nor a lowering of the average span of life." Whether we in Canada should take any solace from this fact, when considering the increase in the tuberculosis death rate, as reported by the Federal Bureau of Statistics to the Canadian Tuberculosis Association, covering the year 1926, is a point to be considered. It shows an increase per 100,000 population of 4.7 over that reported for 1925. The 1925 death rate for tuberculosis in Canada was 79.8, the first time it has been below eighty. The rate for 1926 is 84.5 per 100,000 population. There is an increase registered from every province in Canada except two: British Columbia, which has dropped 2.1 per 100,000 and Ontario 1. per 100,000. Quebec with a little more than one-quarter of our population, shows an increase of 17 per 100,000 over that reported for 1925. This is the first year the Quebec death reports have been assembled in the Federal Bureau of Statistics, but Nova Scotia has also increased 11, Saskatchewan 5 and Alberta 6 per 100,000 respectively and their figures have been assembled in Ottawa for several years. Seven influences suggest themselves as partial explanations:—

1. Each year fewer of our tuberculosis sufferers in Canada are under the excellent medical care of the Federal Department of Soldiers' Civil Re-Establishment.
2. Similarly fewer families of our tuberculosis sufferers in Canada are receiving financial aid for upkeep from the Federal Department of Soldiers' Civil Re-Establishment.
3. The unemployment reported to have existed during the past few years.
4. The effect of expert chest diagnostic assistance to local practitioners now in the rural centres of each province, which means more sick people definitely known to be suffering and dying of tuberculosis.

5. The change in the method of collecting and recording vital statistics in the province of Quebec, now co-operating with the Federal Bureau of Statistics.

6. The 1926 census figures for the Prairie Provinces are used this year for the first calculation of death rates. The increases in populations of these three provinces are slightly less than had been anticipated in the years 1922, 1923, 1924 and 1925, especially that of Alberta.

7. Some might suggest that the freer supply of spirituous liquors and their consumption might be an influence, but this would not be helped by the drop registered for British Columbia, nor by the continued high rates in Quebec and Nova Scotia as the Quebec laws have never been totally dry and the Nova Scotia laws are still as dry as they ever were.

Provinces	Tuberculosis Deaths (All Forms)						Increase per 100,000 population 1926 over 1925.	Population 1926	
	Decrease per 100,000 population 1925 over 1921		1925		1926				
	Total Deaths	Per 100,000 Population	Total Deaths	Per 100,000 Population	Total Deaths	Per 100,000 Population			
Prince Edward Island.....	45	128	144	86	98.7	90	103.4	4.7	87,000
Nova Scotia.....	28	702	134	590	108.0	644	119.2	11.2	540,000
New Brunswick.....	6	413	106	405	100.5	417	102.4	1.9	407,000
Quebec.....	11	2908	122	2937	111	3277	127.8	16.8	2,562,000
Ontario.....	117	2081	71	1842	59.3	1835	58.3	-1	3,146,000
Manitoba.....	11	420	69	383	58.3	387	60.5	2.2	*639,000
Saskatchewan.....	2	322	43	344	41.2	382	46.5	5.3	*821,000
Alberta.....	1	313	53	354	54.2	366	60.1	5.9	*608,000
British Columbia.....	17	409	78	537	95.7	532	93.6	-2.1	568,000
Canada.....	7.8	7689	87.6	7459	79.8	7930	84.5	4.7	9,378,000

*Population enumerated in Census of Prairie Provinces, 1926, to nearest thousand.

The Sanitary Inspectors' Association of Canada

THE PROPER METHODS RESPECTING CHLORINATION OF WATER SUPPLIES

By J. VAN BENSCHOTEN

Manager, Messrs. Wallace and Tiernan, Limited, Toronto, Ontario.

(Read before the Annual Convention, Toronto, Ontario.)

I HAVE been requested to make this paper fairly short and, if possible, to the point. I am assuming, therefore, that you are all fairly familiar with the history of the discovery and application of chlorine as a sterilizing agent. The first practical installation was made at Lincoln, England, in 1905 by Sir Alexander Houston. Next came the work of Col. Johnson in 1908, who used chloride of lime so successfully at the Union Stock Yards at Chicago. Later in the same year he installed another similar plant for the city of Boonton, N.J. and rendered this polluted supply safe for drinking. Following this there were many cities who adopted similar methods of protection without delay.

But, the application of chloride of lime to water was accompanied by so many difficulties and such irregularities of treatment that efforts were made to do away with the troublesome lime carrier and use the pure chemical "Liquid Chlorine".

Various investigators turned their attention to the use of this sterilizing medium but soon found, owing to its corrosive action and extremely small quantities required, that suitable control apparatus must be developed for its regulation and application.

The first equipment was designed by Col. C. R. Darnell at Fort Meyor, Virginia, in 1911. He applied chlorine as a gas and originated the "Direct Feed" method of application. In the same year and in 1912 George Ornstein developed a machine for placing the chlorine in a solution with water, thus developing the "Solution Feed" method of application.

Meanwhile, in New York, Messrs. Wallace & Tiernan had been working on the problem of chlorine control and placed in operation on the Jersey City water supply the first practical chlorinator.

Since that time over 7,000 installations of equipment have been made and about five billion gallons of water are sterilized each day.

In the U.S. in 1907, the census showed a population of 41,758,000 with a typhoid death rate of 30.3. In 1919 the rate had decreased to 9.2 and population increased to 85,148,000. This represents a saving of lives

equal to 21.1 per 100,000 population and on the population of to-day some 110,000,000 a saving of 23,200 lives. Let me repeat this in another way. If there had been the same death rate in 1920 as in 1907, namely 30.3, there would have been 23,200 more deaths from typhoid fever than actually occurred. Nineteen years have passed since 1907, and nineteen times 23,200 lives is 440,800 lives. This will give you some idea of the extreme value of this development to public health.

Let me touch lightly on the cycle of a water supply. Rain descends on the earth, filling brooks, ponds and lakes, etc. Then the sun shines and evaporates the water forming water vapor which is drawn by the sun's rays into the clouds, there to remain until atmospheric conditions cause precipitation in the form of fog, dew, rain and snow, etc.

Water is essential for existence, its greatest purpose is probably to support plant, animal and human life. It is in its first use for drinking, cooking and manufacturing, and second as the vehicle which carries away the wastes and refuse of the earth that we are most concerned

Water, as it falls to the earth, is pure and wholesome and it is the objective of the sanitary engineer to keep this water in the virgin state until it is delivered to our households.

We have lately realized that drinking water is a potent factor in the transmission of disease, particularly intestinal disease. People ill with intestinal disease, such as typhoid, dysentery, cholera, etc., discharge body wastes containing millions of disease germs. Through the natural course of nature these wastes reach or are washed into a water course. If this water is used for drinking the people using it take these disease germs into their bodies. They are then exposed to the disease, for the only way a person can get typhoid fever or other intestinal sickness is to swallow with their food or drink the germ which causes that disease and which came from some person having that disease.

The desire of engineers to obtain water supplies free from contamination has laid the corner stone of a monument to American Sanitation "Modern Water Purification".

I will now skip over a span of years and endeavor to briefly outline present day types of chlorinating equipment for water sterilization and sewage purification and the recognized methods of application.

There are still to-day two basic types of equipment procurable, namely, direct feed and solution feed.

In the former the chlorine is measured by means of suitably designed equipment and applied to the water through a diffuser and in the dry or gaseous state. The use of this type, in Canada particularly, is very limited. It is not the most desirable where the water is extremely cold, due to liquefaction of the chlorine and about the only field for its use is where it is an impossibility to obtain a small water supply under sufficient

pressure to insure the satisfactory operation of a Solution Feed machine. In many cases it is far better to incur the additional expense of a small pump with which to deliver water under sufficient pressure, thus allowing the use of Solution Feed equipment. Suffice to say about the only field for the direct feed type is at the Gate Chamber of a gravity supply and occasionally on sewage work.

Solution Feed equipment is the machine in general use where chlorine is required for almost any purpose. The design of this type has changed considerably over the last 12 or 15 years. To-day machines are available to treat the smallest water supply say down to a minimum of 1 gal. per minute and up to any maximum desired. There has, however, been a radical change in the design and operation of this equipment during recent years. Previously all equipment was of pressure type wherein all piping and parts were continuously exposed to this pressure condition and when any leak occurred chlorine was not only a resultant nuisance in the pumping station but if allowed to persist would deteriorate the machine rapidly. Any pressure type chlorinator is complicated and delicate as compared with the newer Vacuum type. It was necessary to use small orifices, check valves, control and blow-off valves, manometers, compensators, etc., all of which have been absolutely left out of the later type. Of course, thousands of pressure type machines are in service, for when purchased none other could be procured, but it is seldom that they are installed now that a better and far more serviceable unit is obtainable.

To-day this Solution Feed equipment can be purchased incorporating the "Vacuum feature". This design has proven most successful and all operators using this type express themselves very enthusiastically. In this design the grand result has been a very strong, rugged, and compact machine with a noticeable absence of any moving and delicate parts. The chlorine is actually measured under a vacuum, so that the nuisance and deterioration resultant from chlorine leaks has been minimized. All parts exposed to the chlorine being measured are made of either rubber, glass, silver or platinum, on which chlorine has little or no effect. Everything is visible so that the operator knows at any and all times when the machine is functioning properly. It is so simple in construction that the average superintendent or engineer can remedy his own troubles.

I would like to add just a few more remarks in view of your close contact with many places not employing sterilization now but who may be interested in the subject at some future date. In many cases a safe drinking water can be obtained by chlorination only. There will be places, however, where both filtration and chlorination are advantageous. This of course depends entirely on the character of the water in question.

The waters of Ontario as well as the rest of Canada vary greatly in their affinity for chlorine to effect proper sterility. For instance Lake

Ontario water requires approximately 3 to 5 lbs. of chlorine per million gallons, whereas a North Country Brown River water supply may require as high as 30 to 35 lbs. per million. This latter supply properly impounded may require as low as 8 to 10 lbs. per million gallons. You can see, therefore, that the quantity of water to be treated does not govern entirely the type of equipment to be used. Furthermore, in the average pumping station it is necessary to install equipment suitable not only to take care of normal pumpage but also the increased amounts during the emergency of fire periods. It is therefore a case of obtaining all details possible, studying the situation from all angles before a decision as to type, capacity, etc., can be determined. It is, of course, necessary to arrange to treat all water pumped or used and, most important, at the rate of delivery. In many cases this rate may vary suddenly and between wide range, in which case Automatic equipment is desirable. This is a machine which will automatically proportion the flow of chlorine with the varying rate of flow of water.

In some instances pumping equipment may be so arranged that the pumps will cut in and out of service automatically, that is, from a pressure gauge or float arrangement. For such service chlorination apparatus known as of "Semi-Automatic" type is desirable and is one whose operation will be synchronized with that of the pump. However, where the pumpage is at a fairly constant rate, that is, the day and night load being fairly uniform and particularly where operators are always in attendance, the ordinary manual control type will be found satisfactory. This is a machine which will feed a known quantity of chlorine continuously for any setting of the control valve, regardless of any change in pressure or temperature of the chlorine.

You are all probably familiar with the broad use of the Ortho-Tolidin test for determining chlorine residual. There is now no excuse for any operator to apply an insufficient or too great a quantity of chlorine if he will but exercise a little care in his efforts. You all know the standards recommended in this connection. It is quite obvious that a greater chlorine residual is required on an unfiltered water than on one which has received previous purification. This excess chlorine also serves the purpose of taking care of the minor fluctuations in flow of water when no change has been made in the adjustment of the chlorinating apparatus. This testing equipment can now be secured of a design which has eliminated all glass-ware, color standards, etc. It is portable and packed in a neat leather carrying case. This eliminates all glass breakage, loss and fading of color standards, etc. It is customary to introduce the chlorine solution at some point on which no pressure or static head exists, generally within the pump suction or suctions, or into a suction well, clear water basin, etc. If all the pumps are manifolded to one common suction main

then the chlorine solution can be introduced at this point regardless of the number of pumps in service. If individual pump suction exist it will then be necessary to arrange to introduce the solution within each.

In conclusion I would like to mention the rapidly increasing use of chlorine in connection with sewage purification. There are many types of sewage disposal plants with advantages claimed for each. They may vary from the mere collection and discharge type to elaborate systems delivering a germ-free effluent; however, on each chlorine has its place.

A common question seems to be—how much chlorine will be required—and many seem to shut their eyes, assuming the cost prohibitive. This is not the case. We all know that the fresher the sewage the smaller the oxygen demand, and the staler the sewage the more septic it becomes, increasing its demand for oxygen and chlorine (liberation of chlorine having the effect of satisfying the oxygen demand).

From a recent paper published, the following figures appear, namely, on raw or crude sewage containing fecal matter, a maximum dosage of 30 P.P.M. of chlorine may be required, on a briefly sedimented sewage a maximum treatment of 20 P.P.M. may be required while on a well clarified sewage a maximum of 10-15 P.P.M. will generally be ample. The above figures should give a very, very high reduction in bacterial count.

It is now recognized that results to date on the chlorination of crude sewage and effluents from inefficient functioning settling tanks indicate potential advantages previously unknown.

The chlorination of settled sewage retards and if properly administered prevents septic action as well as reducing and eliminating odors. This reduces the oxygen demand in the tank. Under certain conditions proper settling tank treatment combined with chlorination will give satisfactory results and will suffice until such time as local conditions may warrant the installation of the more costly biological beds in addition. The application of chlorine to tank influents is now recommended as it does not impair the digestibility of solids or destroy biological action.

On sprinkling filters the chlorine should be added either to the influent or directly to the filter. Not only are the advantages mentioned above gained but the bacterial count is reduced ahead of the filter. Sprinkler nozzles and distribution piping will render far less trouble from clogging, organic deposits on stone and brush surfaces are removed, thus minimizing choking troubles.

Some of the advantages claimed for the *activated sludge* system are, little offensive odor and fly nuisance, plant can be constructed on small area and near city, effluent can be easily chlorinated for it contains dissolved oxygen. The initial cost of this system is more than many others. We all realize, however, that if the plant is not operated properly it is very inefficient.

Foaming and odors seem to be the main source of trouble with *Imhoff Tanks* and pre-chlorination seems to have remedied this condition pretty well.

It is recognized by all that the chlorination of sewage effluents reduces their oxygen demand. The period of contact need be little more than instantaneous. The Ortho-Tolodin test should be used to determine chlorine residuals if very high bacterial removal is desired and if a proper residual is maintained a removal as high as 98 to 99.8% can be expected.

I sincerely hope my above remarks have been of interest. This subject is a very broad one with the result that I hardly know where to start and when once on my way seldom know when to stop.

Monthly Jottings of the Sanitary Inspectors' Association of Canada

In the September "Review," which is the official Journal of the New Zealand Sanitary Inspectors' Association, an interesting article appears entitled:—"Some Aspects of House Fly Control, and the Viability of the Newly 'Hatched' Fly Under Adverse Conditions". The article was from the pen of Mr. D. H. Wallace, Chief Health Inspector, Municipality of Broken Hill, Australia, and originally appeared in the *Quarterly Review* of the Australian Health Inspectors' Association.

Mr. Wallace, in order to find out under what conditions the pupae of the house fly would develop into living flies did some original investigations by burying, first the larvæ, and later the pupae of house flies under six or seven inches of sandy garden soil, placing fly traps over the site and noting the number of flies emerging from the soil. Out of one thousand pupae buried, about 12% hatched out into fully grown flies and made their way through the earth to the surface at varying periods from 18 hours to 18 days. This in spite of the fact that the temperature at night was as low as 40 degrees F.

An interesting account of how the flies manage to do this is given as follows: "It is pretty generally known among public health officials, who have had any experience in the work of fly reduction, that the fly possesses what is known as a frontal sac placed in the front portion of the head between the eyes, and that by the inflation of this sac the newly hatched fly is enabled to work its way out of earth, manure, or other such matter in which the puparium from which it emerges may be buried.

"The imago instinctively works upward through the super-imposed material persistently and laboriously by inflating the sac, which appears as a small, whitish ball in front of the head, widely separating the eyes, and giving the head a grotesque appearance. The inflation of the sac displaces the material above the head, and the fly then deflates the sac, pushing upward to occupy the space thus created, and so at length accomplishes the apparently impossible.

"This fact, and the depth from which a fly can, and with apparently little trouble, work itself free, have both a very important bearing on the work of fly reduction, because the fly must be fought while breeding, and before it has a chance to spread disease, and repressive measures in fly control rank very much higher in value than palliative measures, necessary though the latter are.

"From the foregoing, then, it becomes apparent that an appreciable amount of house fly infestation must result from the burial in gardens

of larva-infested material, horse dung particularly, even when such material is placed under the soil, and not, as is commonly the custom, spread on the surface or allowed to remain in a heap long enough for mature larvae to migrate from it or pupate in the heat, and emerge as flies from it.

"Effective fly control is one of the most difficult problems that confront the sanitarian, recognizing, as we do, the maxim that this death-dealing insect must be fought at its breeding places.

"The lot of an Inspector of a local authority in this regard especially is an unenviable one, unless he has the strong support of the Central Health authority (the writer fortunately enjoys a good measure of such support), for, in addition to a host of recalcitrant and sceptical horse owners, he frequently is faced with the task of overcoming the opposition of members of his own Council, expressed at meetings and in the press."

It is refreshing to read of a brother Sanitary Inspector undertaking original research work on his own account instead of waiting, as so many of us do, for the other chap to do the investigating and then putting his discoveries to practical use. We should be glad to hear of other simple research work done by Sanitary Inspectors in matters affecting their daily work and problems. There must be other lines of investigation which might be undertaken by Sanitary Inspectors even without any expensive laboratory equipment. Quite recently a Winnipeg Inspector did some useful investigation in a case where the ground outside a warehouse in which sheep pelts were stored became heavily infested with fly larvae. The nuisance extended to a considerable depth. Larvae and pupae were collected and allowed to hatch out in earth, when it became evident that the species of fly produced was a large green fly with a propensity for laying eggs in raw sheep pelts. By soaking the ground with a solution of Paris Green, the larvae were destroyed.

The paper raises the question of the use of manure in Cities for gardening purposes. Sanitary Inspectors have been under the impression that if they succeeded in getting all manure kept in tightly covered bins, and removed at frequent intervals, and that if all manure delivered for horticultural purposes was properly dug in, that he had done all that was necessary to prevent nuisance from flies. It may become necessary for us to revise our views in this matter. Have any of our members further information on this subject?

The members will be sorry to learn of the sickness of Mr. F. Cartlidge of Moose Jaw. Mr. Cartlidge went on an extended holiday to visit his son in the States and was taken seriously ill and has been in hospital for some weeks. The Secretary has written a suitable letter to Mr. Cartlidge.

The Vancouver members commenced their winter programme of meetings in October. They have a good syllabus and hope to enjoy an interesting season of papers, lectures and discussions.

The Winnipeg members have also arranged their winter meetings and have secured some able lecturers in addition to a number of papers provided by the local members.

We wish once more to point out the value of these meetings. Wherever a group of our members can be got together, we recommend a course of study or a series of subjects for discussion, such as those referred to above, as a means of refreshing in old topics as well as gaining information on new matter.

One aspect of such gatherings is that Health Committees and City Councils very quickly realize that we are in earnest about our work. By such means, even the public will find out that a Sanitary Inspector has a large field of technical knowledge to cover. The result is likely to be in our best interests in the end, so that a part altogether from the fact that we should always be studying with the view to becoming more efficient, we are likely to profit by the raising of our profession to a higher plane, and incidentally receiving more and better recognition,—even from a monetary point of view.

The Vancouver and Winnipeg members meet once a week during the winter. Other centres might find this too frequent and meetings once every two weeks or even once a month might serve. The main thing, however, is to have such meetings; they are the best and surest means of raising our profession individually and collectively.

The Secretary has commenced on a membership campaign and has already written to a number of old members who have lapsed or otherwise dropped out of membership. We are meeting with a fair measure of success and are hopeful of bringing back many of those whom we have lost at various times.

In connection with the membership campaign, the Secretary would be glad to get information that will put him in touch with our fellows in Nova Scotia and New Brunswick. Can anyone assist us in this matter?



The Provincial Department of Health of Ontario

Communicable Diseases Reported for the Province by Local Boards of Health for the Weeks Ending October 1st, 8th, 15th, 22nd, 29th, 1927.

COMPARATIVE TABLE

Diseases	1927		1926	
	Cases	Deaths	Cases	Deaths
Cerebro Spinal Meningitis.....	3	2	5	1
Chancroid.....	5	—	1	—
Chicken Pox.....	571	—	544	—
Diphtheria.....	346	20	429	22
Encephalitis.....	—	—	7	5
Gonorrhoea.....	179	—	177	—
Influenza.....	9	7	—	10
German Measles.....	13	—	7	—
Measles.....	383	—	383	—
Mumps.....	448	—	25	—
Pneumonia.....	23	95	—	128
Poliomyelitis.....	21	4	27	4
Scarlet Fever.....	411	1	351	1
Septic Sore Throat.....	7	—	3	—
Smallpox.....	160	—	75	—
Syphilis.....	147	—	173	—
Tuberculosis.....	125	62	96	54
Typhoid.....	128	4	101	10
Whooping Cough.....	275	4	304	3
Actinomycosis.....	2	2	—	—
Conjunctivitis Acute Infections..	1	—	—	—
Dysentery.....	1	9	—	—
Puerperal Septicaemia.....	—	2	—	—
Rabies.....	1	—	—	—
Tetanus.....	—	1	—	—
Goitre.....	1	—	—	—

The following municipalities reported cases of Smallpox:—

Fitzroy 1, Nepean 3, Ottawa 114, Oshawa 2, Blandford 1, Himsworth S. 3, Hagerman 1, South River 5, Fullarton 2, Alfred 2, Dymond 1, Harris Tp. 1, Kitchener 3, Clifford 1, Guelph 1, Gwillimbury N. 2, Toronto 13, York E. 4.

News Notes

Ottawa's situation in as far as smallpox and vaccination are concerned, reached a deadlock shortly after the discovery of the disease. The first few cases reported were soon followed by others, and within a few days, the total had reached forty. Dr. Lomer, the civic health officer, felt that the situation called for immediate action and a compulsory vaccination order was the result.

It was immediately obvious that the attitude of the people of Ottawa towards vaccination was divided. Six thousand children, refusing to be protected, remained away from school. The mayor lined up with those opposed to this measure for public safety or, at least, refused to support the demands that the population of the city and the children, in particular, be protected by vaccine.

Meanwhile, the cases of smallpox continued to increase.

Considerable educational work, both through the press and the distribution of literature, is being carried on by the Canadian Social Hygiene Council, in co-operation with the provincial department of health.

The opposition, however, is strong. Smallpox continues to increase and the situation, as far as those interested in the prevention and eventual suppression of the disease, are concerned, is far from satisfactory.

The source of a recent outbreak of typhoid fever in Stratford, Ontario, has been traced by health officials to the milk sold by one specific dairy. The first three victims used milk from this source and the fourth was an occasional customer. The dairy was ordered to pasteurize its output at once and the possibility of an epidemic has been eliminated.

Development of a few cases of diphtheria in and around Windsor has brought prompt action and children in the schools are voluntarily applying to the health officials for immunization with toxoid. As was the case in the smallpox epidemic of some years ago, the authorities are receiving excellent co-operation from parents and the adult population generally.

Sir Arthur Currie, principal of McGill and Hon. L. A. David, provincial secretary, addressed the 38th annual meeting of the Association of American Medical Colleges, held in Montreal recently. Sir Arthur sketched the growth of McGill's medical school and Hon. Mr. David told

of medical work throughout the province, paying particular attention to the highly effective manner in which Quebec is controlling the venereal disease problem.

Health authorities in St. John, N.B., are campaigning against diphtheria with good results. In the course of one afternoon, recently, fifty children applied at the Health Clinic for immunization with toxoid.

North Bay, Ontario, at the end of October, was in the fortunate position of having only one case of contagious disease reported.

Child Labor Day will be observed in the United States for the twenty-first consecutive year the last week-end in January, 1928. As in former years this will be the occasion for religious and educational organizations, women's clubs and other interested groups to bring to the attention of their members the fact that child labor is not yet solved.

Child Labor involves more than the mere question of the age at which a child should be allowed to go to work. It includes the prohibition of all work for children under 14, and of dangerous work for children under 16; it includes the establishment of an 8 hour day and the prohibition of night work for children under 16; and evidence that the child is strong enough for work.

The National Child Labor Committee, 215 Fourth Avenue, New York City, will send free of charge to any interested groups an analysis of the law of their state and other material to aid in the observance of Child Labor Day.

The Canadian Social Hygiene Council is forwarding a Health News Service regularly to over 900 papers. This service is supplied in both French and English. Copies of this News Service may be obtained from the Canadian Social Hygiene Council or the *Public Health Journal*. Local Health Officers who desire this service to appear in newspapers of their own locality should communicate with their local newspaper editors.

Editorial

REDUCING MORTALITY

The evidence on every side of the gradual building up of a public opinion in favor of health organization gives rise to many conjectures as to how far the movement will go. The possibilities are unquestionably great. The rapidity with which the movement progresses will of course depend largely on the extent to which public education is developed.

The increase in the average duration of human life already accomplished in a comparatively short time is so striking that it gives one considerable food for thought. Professor Irving Fisher makes the statement that although in the 17th and 18th centuries the average increase was at the rate of only four years per century, in the first three-quarters of the last century it was at the rate of nine years, in the final quarter, at the rate of fourteen years and in the first quarter of the present century at the surprising rate of forty years per century. Recent increase has been largely due, of course, to the discoveries of Pasteur in the seventies of the last century.

How far the increase may go is, of course, problematic but it is probable that if means can be evolved for protecting the human cell from damage by infections of many types which now assail it—frequently insidiously—longevity may be increased far beyond its present limits. In addition an interesting observation by Lyman Fiske to the effect that it will be necessary to go to the roots of the matter and strike where the trouble starts, attacking the social, moral and mental, as well as the physical factors which are the basic reasons for preventable disease, confronts one with the fact that health authorities have as yet given little, if any, attention to such causes of disease.

It is obvious that while it is true that education will solve the future problems of health conservation it would appear that in spite of Pasteur, the leaders of the public health movement have much study ahead in order that they may be prepared to fully and properly educate.

PERIODIC HEALTH CONSERVATION

It is understood that the Canadian Medical Association has completed the tentative draft of a periodic health examination form. The taking of the necessary steps to elaborate such a form indicates that the Canadian Medical Association is fully aware of the trend of the times and is prepared to keep in the van of progress. The elaboration of a standard form

for use in the examination of the apparently well is, of course, an essential factor, if that very important instrument in the building up of a healthy nation—the periodic health examination—is to become established as a part of our recognized health conservation machinery.

With the form ready for distribution to the physicians of Canada every possible effort should be made to educate both the profession and the public as to its value. All voluntary associations should do their part in developing schemes for calling the matter to public attention and an effort should be made to immediately make the periodic health examination really effective. One may suggest that a not ineffective method of persuasion would be for the many proponents of the idea to have themselves examined on the new form. It is probably not exaggerating to say that were it possible to analyze and publish the results of a series of examinations even on those of us who seem the healthiest the result would be to say the least surprising—and in itself not without educational value.

